ABSTRACT OF THE DISCLOSURE

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Devices and methods are provided for temporarily inducing cardioplegic arrest in the heart of a patient and for establishing cardiopulmonary bypass in order to facilitate surgical procedures on the heart and its related blood vessels. Specifically, a catheter based system is provided for isolating the heart and coronary blood vessels of a patient from the remainder of the arterial system and for infusing a cardioplegic agent into the patient's coronary arteries to induce cardioplegic arrest in the heart. The system includes an endoaortic partitioning catheter having an expandable balloon at its distal end which is expanded within the ascending aorta to occlude the aortic lumen between the coronary ostia and the brachiocephalic artery. Means for centering the catheter tip within the ascending aorta include specially curved shaft configurations, eccentric or shaped occlusion balloons and a steerable catheter tip, which may be used separately or in combination. The shaft of the catheter may have a coaxial or multilumen construction. The catheter may further include piezoelectric pressure transducers at the distal tip of the catheter and within the occlusion balloon. Means to facilitate nonfluoroscopic placement of the catheter include fiberoptic transillumination of the aorta and a secondary balloon at the distal tip of the catheter for atraumatically contacting the aortic valve. The system further includes a dual purpose arterial bypass cannula and introducer sheath for introducing the catheter into a peripheral artery of the patient.